



Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

METALS PROCESSING GROUP LED BY DR. LEE SEMIATIN EARNS COVETED STAR TEAM AWARD



Dr. Lee Semiatin's leadership of the Materials and Manufacturing Directorate's Metals Processing Group led to a number of improvements in existing processes and the successful development of several new processes for high-temperature alloys. His team's selection for an Air Force Office of Scientific Research (AFOSR) Star Team Award recognizes team and individual achievements, as well as the vital contributions of the directorate, in support of Air Force operational requirements.



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Accomplishment

The directorate's Metals Processing Group, led by internationally renowned scientist Dr. Semiatin, recently received AFOSR's Star Team Award. The award recognizes teams of researchers who demonstrate world-class status and excellence in their chosen research areas. AFOSR previously recognized Dr. Semiatin's teams as Star Team recipients in 1992, 1995, and 2000.

AFOSR recognized Dr. Semiatin, a senior scientist in the directorate's Metals, Ceramics, and Nondestructive Evaluation Division, and his research team for significant achievements in four major areas: wrought processing of titanium, nickel, and advanced intermetallic alloys; solidification processing of titanium (Ti) including permanent mold casting and laser deposition; advanced modeling techniques for processing; and novel processes for making fine grain, high-strength aerospace alloys including development of innovative processing methods for cryomilled aluminum alloys.

Background

AFOSR recognized Dr. Semiatin and his research team for a number of achievements including development of integrated material behavior models for constitutive behavior, deformation mechanisms, and microstructure evolution during hot working of colony microstructure Ti and Ti aluminide alloys (with applications to the breakdown of ingot microstructures); successful development of models for microstructure and texture evolution during solidification processing of Ti; development and implementation of advanced modeling and simulation techniques for deformation and solidification processes including cellular automata, texture models, and phase-field models; and development of workability criteria and validation of a novel method for producing fine-grain, defect-free, aerospace alloys referred to as the upset/equal-channel angular extrusion (ECAE) technique.

AFOSR also recognized Dr. Semiatin's research team for development of fundamental understanding of workability and methods for extrusion and ECAE of nanophase aluminum alloys for space applications; establishment of workability and demonstration of wrought processing of an advanced molybdenum-silicon-boron alloy for advanced turbine airfoils; increased understanding and successful demonstration of wrought processing of low-cost, laser-deposited Ti forging preforms; and successful development of a fundamental understanding of mold wear during permanent mold casting of Ti (a lower-cost alternative to conventional investment casting and wrought-processing approaches).

Materials and Manufacturing
Awards and Recognition

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-ML-19)